

**NOTES ON THE BIOLOGY AND DISTRIBUTION OF  
*PAROPSISTERNA SEMIFUMATA* (BLACKBURN) (COLEOPTERA:  
CHRYSOMELIDAE) IN SOUTHEASTERN AUSTRALIA**

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**Abstract**

The biology of *Paropsisterna semifumata* (Blackburn) is discussed and the adult, larva and pupa are illustrated. The host plants are *Callistemon sieberi* and *C. viminalis* (Myrtaceae). *P. semifumata* occurs from southeast Queensland to Victoria.

**Introduction**

*Paropsisterna* Motschulsky is an endemic Australian genus of the leaf-beetle subtribe Paropsina, subfamily Chrysomelinae. Weise (1916) included 55 species, most of which are uncommon in collections and have been rarely studied. For example, only a small number of species (sometimes listed as species of *Paropsis* Olivier) have recorded associations with plants: *P. beata* (Newman) with *Eucalyptus* (Cumpston 1939, Kelly 1987, Hawkeswood 1988, Reid 1992, Stone and Urquhart 1992, Stone and Bacon 1994); *P. brunnea* (Marsham) with *Acacia* (Brooks 1948); *P. liturata* (Marsham) with *Eucalyptus* (Cumpston 1939); *P. nucea* (Erichson) with *Eucalyptus* (Morrow 1977); *P. octomaculata* (Marsham) with *Acacia* (Brooks 1948, Hawkeswood 1988) and *Eucalyptus* (Brooks 1965); *P. sexpustulata* (Marsham) with *Eucalyptus* (Brooks 1965); *P. octosignata* (Stål) with *Eucalyptus* (Stone and Urquhart 1992); *P. rufipes* (Fabricius) with *Eucalyptus* (Morrow 1977, Kelly 1985) and *P. tigrina* (Chapuis) with *Melaleuca* (Maddox 1996, Macdonald and Elder 1998).

The general consensus from published records is that *Paropsisterna* feeds on *Eucalyptus* or *Melaleuca* (in the case of *P. tigrina*). Paropsine species are often collected on trees or shrubs adjacent to their actual host plants (pers. obs.) and the above records from *Acacia* species may not represent actual hosts.

*Melaleuca alternifolia* is the main species cultivated in the tea-tree oil industry in northern New South Wales. *P. tigrina* is an important pest of the industry and is morphologically anomalous within *Paropsisterna*, having non-striate elytra, showing significant adult colour change after death and with larvae that have considerably shorter setae than those of eucalypt-feeding species (C. Reid, pers. comm.). This paper records some observations of *P. semifumata* (Blackburn), another atypical member of the genus. Voucher specimens have been lodged with Museum Victoria.

**Observations**

On 9 November 1997, a single adult of *P. semifumata* was picked from a leaf of *Eucalyptus camaldulensis* [River Red Gum] along Jacksons Creek, within

the Organ Pipes National Park (OPNP), 20 km northwest of Melbourne. The riparian trees and shrubs in this area of the Park include *E. camaldulensis*, *Callistemon sieberi* (formerly *C. paludosus*: Lumley and Spencer 1988) [River Bottlebrush] and *Leptospermum lanigerum* [Woolly Tea-tree].

On subsequent visits to the Park on 13 December 1997 and 28 February 1998, further adults of *P. semifumata* were collected but only on *Callistemon sieberi*. They were offered fresh leaves of various trees and shrubs, including *Eucalyptus* and *Leptospermum* species, but only consumed *Callistemon* species. A single late instar, paropsine-like larva was collected from a large *C. sieberi* bush at Jacksons Creek, OPNP on 17 January 1999. A return visit to the site two weeks later found no further larvae or adults. Four larvae were collected from the same bush on 4 November 1999. No adults were found on that occasion despite a thorough search.

The larva collected on 17 January 1999 was kept in a 200 ml plastic container. Small potted *C. sieberi* were obtained from a local nursery and small amounts of foliage were supplied to the larva. The leaves were changed every few days. The larva consumed large amounts of the young apical leaves before becoming a quiescent pre-pupa on 22 January. Pupation occurred on 27 January at the base of the container. It is assumed that in the wild the final instar larva drops to the ground or moves to the base of the host tree and pupates in an underground cell, as noted by Cumpston (1939). An adult *P. semifumata* emerged on 2 February and commenced feeding on *C. sieberi* leaves two days after emergence.

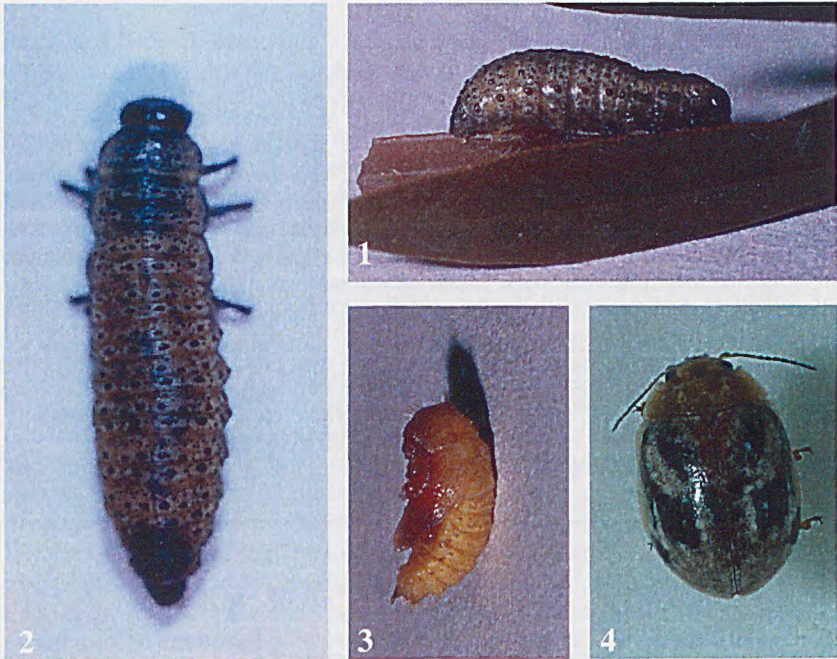
The larvae collected on 4 November 1999 consisted of two final instar larvae and two third instar larvae. One specimen was fixed in KAA and preserved in 70% alcohol. Two were parasitised by tachinids (which pupated on 17 November and emerged on 4 December) and one pupated on 17 November and emerged on 28 November.

### Life history

*Host plants.* *Callistemon sieberi* and *C. viminalis* (Myrtaceae).

*Larva.* No detailed larval sclerite pattern drawings were made. Early instar larvae were pale green with dark brown head capsule and legs. Final instar larvae (Figs 1-2) have numerous dark brown sclerites in two transverse rows on each segment except the pronotal shield. The pronotal shield is covered by numerous small dark brown sclerites. The dorsal body colour of the final instar larva is pale brown. Final instar larvae were approximately 10 mm long and possessed short, inconspicuous setae.

*Pupa* (Fig. 3). Body dark, yellow-brown in colour, the elytral and wing thecae and legs pale violet. A strongly bifid urogomphus and well developed lateral tubercles were present. Length 7.5 mm.



**Figs 1-4.** *Paropsisterna semifumata*. (1) Larva, lateral view; (2) Larva, dorsal view; (3) Pupa; (4) Live adult.

*Adult* (Fig. 4). Oval in shape and moderately convex, with filiform antennae and securiform maxillary palpi. The elytra extend vertically below and over the lateral edge of the abdomen, typical of paropsine species. The pronotum and parts of the suture near the scutellum are yellowish-brown with the main part of the elytra possessing some irregular oblique, brownish-black markings over a whitish background. After death, the whitish colour fades to yellowish-brown and the brownish-black markings fade to some extent to a smoky black colour, which can still be discerned in most preserved specimens. The elytral punctuation is irregular and generally finer and sparser on the whitish areas on the elytra. Adults examined by the author were 5 to 7 mm long.

### Distribution

The following specimen data were used to plot the distribution of *P. semifumata* (Fig. 5). Victorian specimens and the Clarence River specimen were examined by the author, all others by Chris Reid. Abbreviations are: AMS - Australian Museum, Sydney; ANIC - Australian National Insect Collection, Canberra; MV - Museum Victoria, Melbourne; IGF - Ian G. Faithfull collection.

*Material examined.* QUEENSLAND: 3, Upper Brisbane River, east branch No. 2, (26°37'S 152°14'E), 15.i.1992, P.J. Gullan (ANIC). NEW SOUTH WALES: 6, Byrill

Creek, 10 km SW Uki, ex *Callistemon viminalis*, 23.xi.1986, C. Reid (ANIC); 3, Dingo Creek, nr Wingham, 2.ix.1961, C.N. & A.S. Smithers (AMS); 1, Macleay River, xi.1928, H.J. Carter (ANIC); 8, Shoalhaven River, 15 km NW Braidwood, ex *Callistemon paludosus*, 13.i.1987, 18.i.1987, C. Reid (ANIC); 1, Clarence River, ix.04, HJC (MV). VICTORIA: 3, Avenel, 9.xii.54, Neboiss; 1, Mansfield, 25.iii.1958 A.N.; 1, Morrisons, 30.xi.49, E.M.; 4, Kerrisdale; 1, Kerrisdale, 2.xi.14; 1, Trawool, 27.xii.20; 1, Warburton? from R.T. Kelly Esq, Healesville; 1, Organ Pipes National Park, on juvenile *E. camaldulensis*, 9.xi.1997, D. Dobrosak; 2, Organ Pipes National Park at Ford over Jacksons Creek, ex *Callistemon sieberi*, 13.xii.1997, D. Dobrosak; 1, Organ Pipes National Park, Tesselated Pavement, ex *Callistemon sieberi*, 28.ii.1998, D. Dobrosak; 1, Organ Pipes National Park, at Ford over Jacksons Creek, *Callistemon sieberi*, larva coll. 4.xi.1999, pupated 17.xi.1999, emerged 28.xi.1999, D. Dobrosak; 1, Organ Pipes National Park at Ford over Jacksons Creek, *Callistemon sieberi*, larva coll. 17.i.1999, pupated 27.i.1999, emerged 2.ii.1999, D. Dobrosak (MV); Yarra Bend Park, 9.ii.1993, Ross McPherson, on *Callistemon paludosa*; 1, Killawarra, Ovens River, 10 km N of Wangaratta, 25.i.1998 (IGF).

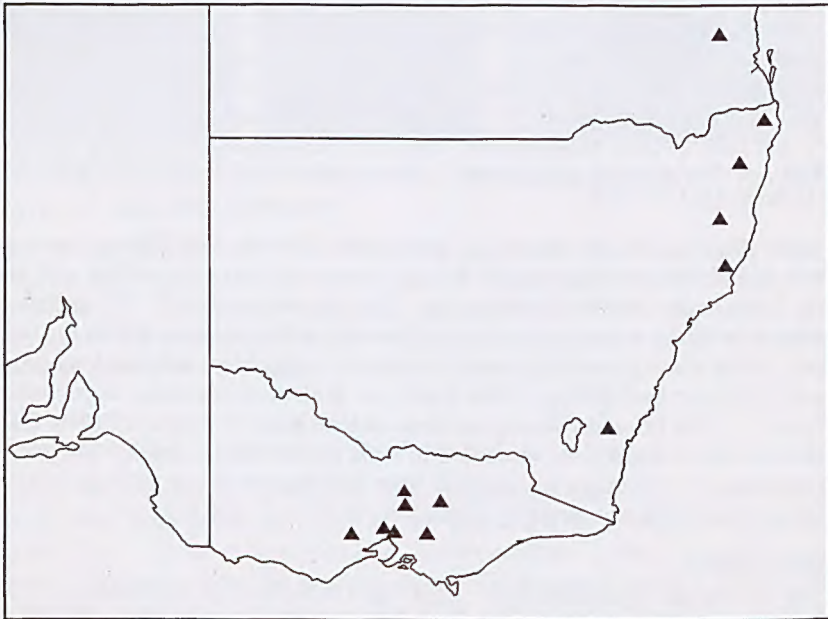


Fig. 5. Distribution of *Paropsisterna semifumata* in southeastern Australia.

## Discussion

All specimens were collected from November to February, in riparian habitats. The species may be univoltine, or bivoltine with a short summer generation. The larvae appear to be solitary, as in other *Paropsisterna* species (Cumpston 1939). The distribution appears to be curiously bimodal, with one centre in Victoria and southern New South Wales and the other in northern New South Wales and southern Queensland. The type locality is Richmond River, northern New South Wales (Blackburn 1901). Specimens from the two centres have been dissected and the genitalia appear to be identical (C. Reid, pers. comm.). The northern populations are associated with *Callistemon viminalis*, which is endemic to this area (Rotherham *et al.* 1975). The southern populations are associated with *C. sieberi*, which is patchily distributed in southeastern Australia, including northern New South Wales (Costermans 1996, Walsh and Entwisle 1996). *P. semifumata* is not common and does not appear to have colonised the numerous cultivated *Callistemon* species in metropolitan and suburban areas. It is apparently restricted to *Callistemon* trees and shrubs in their natural habitat along creeks and rivers. Bennet (1999) noted that riparian vegetative communities in Victorian Box-ironbark regions were among the most depleted and disturbed of the vegetation types. These short notes on an uncommonly collected species that appears to be restricted to *Callistemon sieberi* and *C. viminalis* along rivers and creeks highlight the need to conserve remnant riparian communities.

This is the first record of a paropsine feeding on *Callistemon*, a genus in Myrtaceae but quite unrelated to *Eucalyptus*. However, *Callistemon* and *Melaleuca* form a single clade in the Myrtaceae (Johnson and Briggs 1984) and *Paropsisterna tigrina* feeds on *Melaleuca*. *P. tigrina* and *P. semifumata* are similar to each other and differ from other *Paropsisterna* species by having adults which fade significantly after death, with non-striate elytra, larvae with short setae and pupae without prominent, fist-shaped spiracular tubercles (C. Reid, pers. comm.). It is thus likely that these are closely related species.

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